Technical Report No. 90-01

Re-evaluation of the status of the wolverine in Manitoba.

By Johnson, C.S. 1990.

Manitoba
Natural Resources
Wildlife
Biological Services

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ABSTRACT

The status of the wolverine (*Gulo gulo*) in Manitoba in 1990 was re-evaluated in comparison to 1972, recent historical sales records and trapper questionnaires were evaluated to determine the present status. The wolverine population was estimated between 500 and 800 animals. Re-population of some of its former range was attributed to cessation of predator poisoning, increase in the wolf (*Canis lupus*) population and a shortened trapping season. Management recommendations included biological studies and considered the role of carnivores in big game management.

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INTRODUCTION

The wolverine (*Gulo gulo*) is considered vulnerable in Canada by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (1989) with the eastern subpopulation being endangered. In Manitoba wolverine have also been considered rare (van Zyll de Jong 1972, 1975, Holbrow 1976, Kelsall 1981). Data used to make these conclusions were largely circumstantial evidence, all that is generally available due to the nature of the species. Few biological studies have been conducted, especially in Canada, (Rausch & Pearson 1972, Banci 1987) and none outside the Montane Region.

Large changes in the fur sales distributions of wolverine in Manitoba have been observed since first analyzed by van Zyll de Jong in 1972. Fur sales records are used as population trend indicators and harvest estimates.

The intent of this report is to review the status of wolverine in Manitoba up to 1990 based on fur sales records and other incidental information that was available.

Methods

Recent historical and fur sales records (1919-89) were examined for population trends and distribution. Trapper questionnaires on the status of furbearer species were examined in 1987 through 1989. Sales for the areas of range extension were investigated for confirmation. The formula used by van Zyll de Jong (1972) for relative abundance was used for calculations. The average number of active trappers over the past four

years for each section was used in the recent calculations. These figures were the best data available and comparing them to some of the historical records indicated there was little change in the number of active trappers, although the total number of trappers may have varied widely. The number of active trappers provided a better comparison for trapping density than the total area of a section. Many sections have large portions untrapped. The maximum area a trapper was physically able to cover probably differed little from section to section whether the total area was big or small. Therefore, the area per active trapper would be similar for comparison from section to section.

RESULTS

Distribution

Historically, Kelsall (1981) indicated wolverine populations once occurred continuously across most of Canada and much of the northern United States (Fig. 1), which included all of Manitoba. With settlement this species was extirpated from much of its traditional range and its boundaries pushed back to the fringe of civilization (Seton 1909) (Fig. 2). Van Zyll de Jong (1972) indicated a further recession into boreal regions with increased agriculture and spreading civilization. The present range, 1990, in Manitoba included much of the 1909 range excluding areas that have since been farmed or cleared, ie. the Interlake (Fig. 2).

Status

As indicated by van Zyll de Jong (1972) regular documentation of fur sales began in 1919 (Appendix I) (Johnson 1989a). There have been variable sales and values over the years with a resurgence of larger numbers being

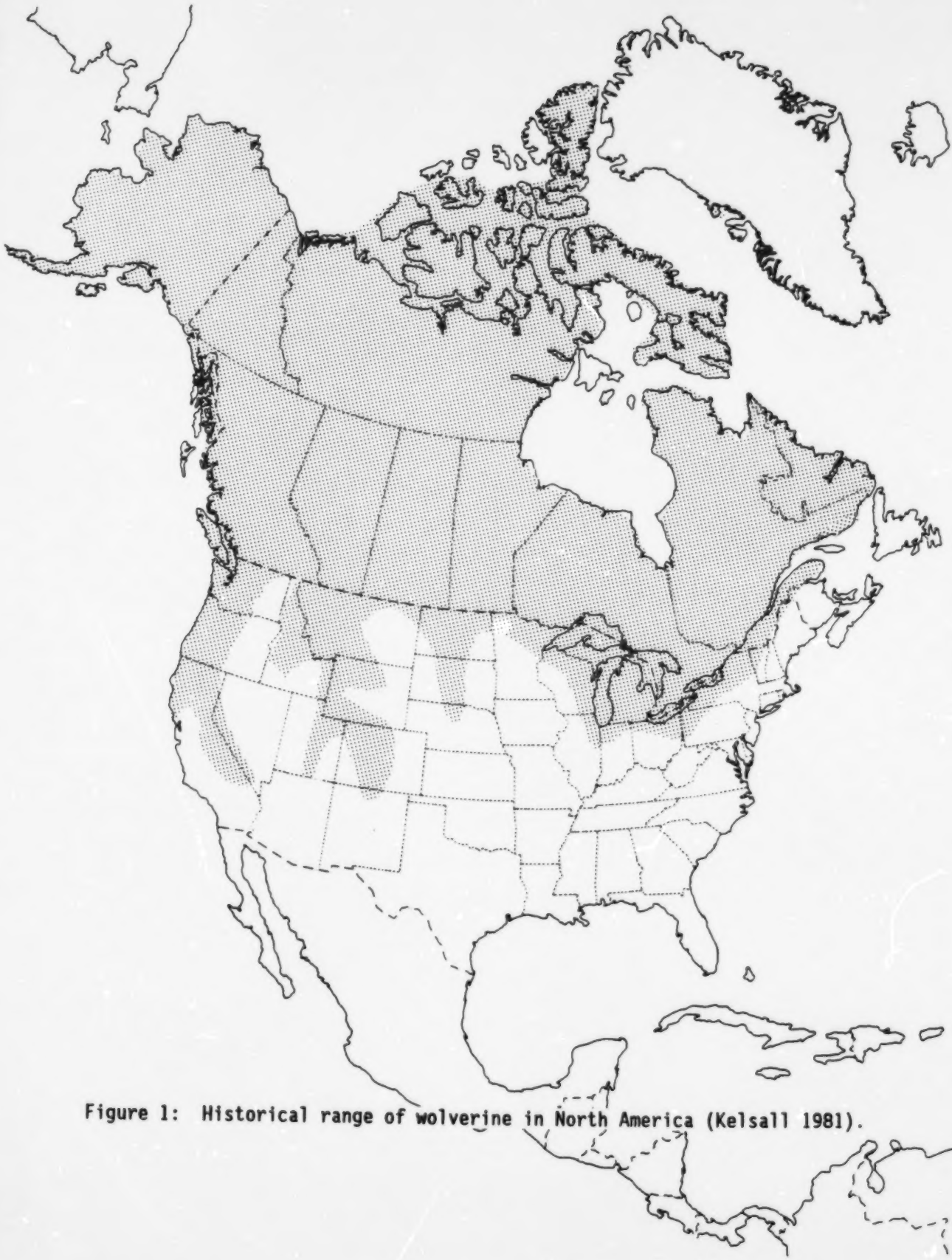

Figure 1: Historical range of wolverine in North America (Kelsall 1981).

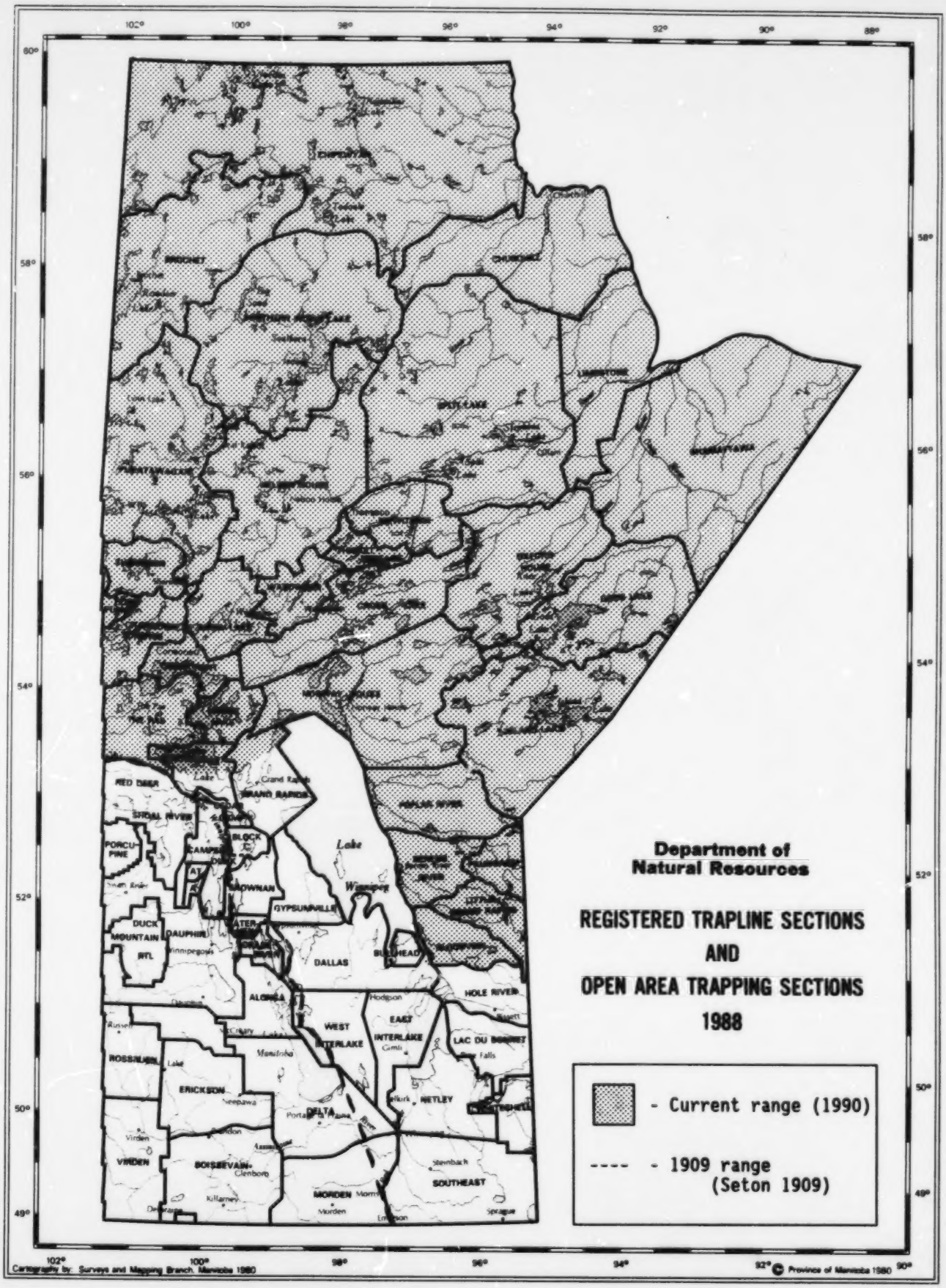

Figure 2: Current range of wolverine in Manitoba

sold in the early 1980's. Between 1934-1975 very low numbers were reported sold.

Beginning in 1959-60 when trapline section sales records were kept in detail, the major harvest areas appeared to be Brochet, Chipewyan, South Indian Lake, Nelson House and Split Lake sections with lesser numbers reported from Pukatawagan and Snow Lake and occasional sales records from Limestone, Shamattawa, Oxford House, God's Lake and Wabowden (Fig. 3 Appendix II) (Johnson 1989a).

In the 1970's harvest concentration shifted to Pukatawagan, Split Lake, South Indian Lake, Nelson House, Snow Lake, Wabowden, Thicket Portage, Pikwitonei and Norway House with fewer numbers sold from Shamattawa, Oxford House, Island Lake and Sherridon. There were occasional reports from Brochet, Chipewyan, Churchill, Limestone and Cormorant (Fig. 4) (Johnson 1989a).

During the 1980's the number sold increased two to five times, the concentration remained in the core area but included Oxford House and Island Lake also. There were some increased sales in Cross Lake and Poplar River but a decrease in Sherridon; occasional records were found from Cranberry Portage, Cormorant, Berens River and Bloodvein (Fig. 5) (Johnson 1989a).

The wolverine in Manitoba appeared to be confined north of the 53rd parallel. This is 4° or about 408 km further south than indicated by van Zyll de Jong (1972) and extending farther down the east side of Lake Winnipeg.

Using the same principles as van Zyll de Jong (1972) the relative abundance of wolverine changed in distribution from section to section for

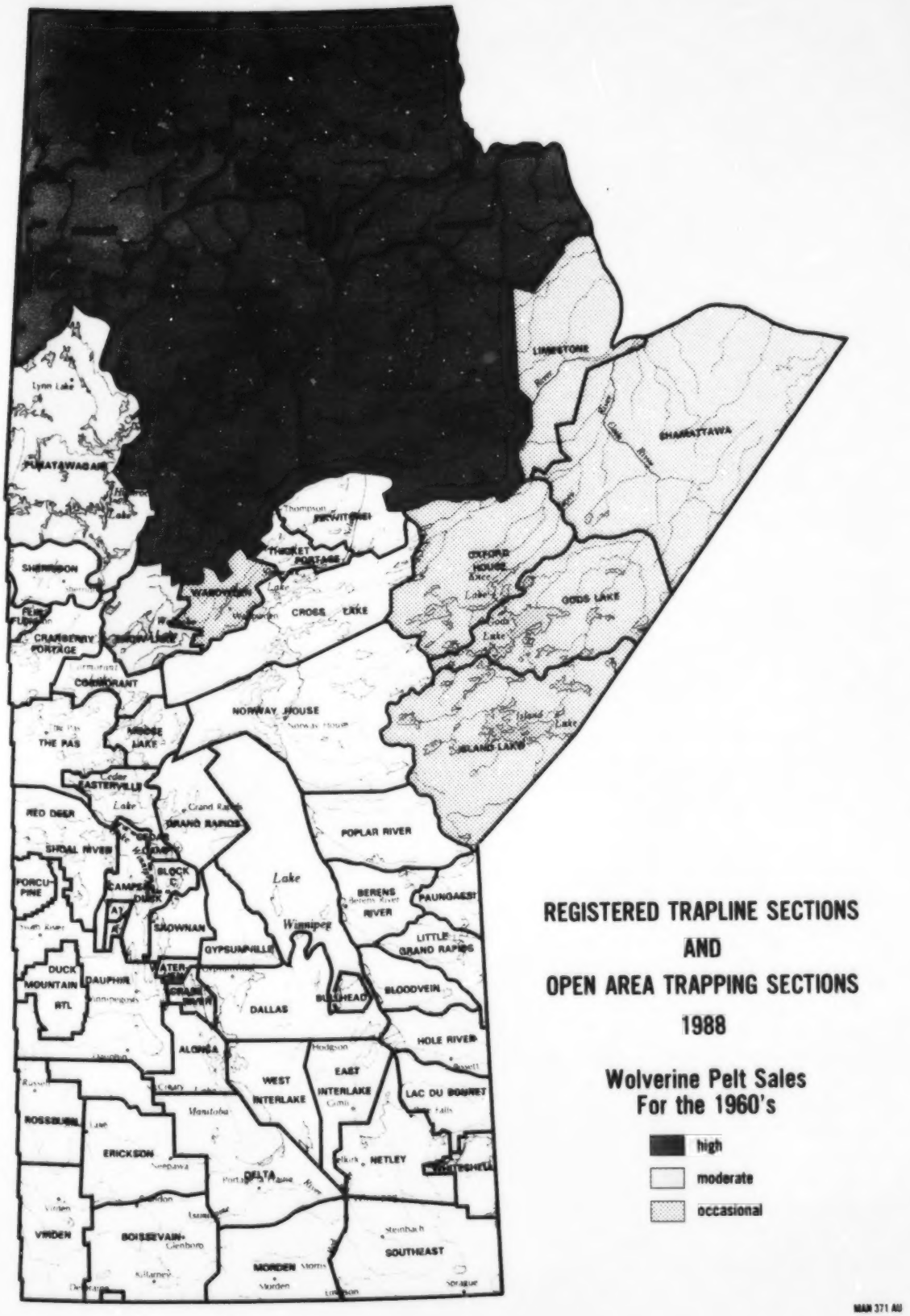

Figure 3: Wolverine pelt sales pattern in Manitoba for 1960s.

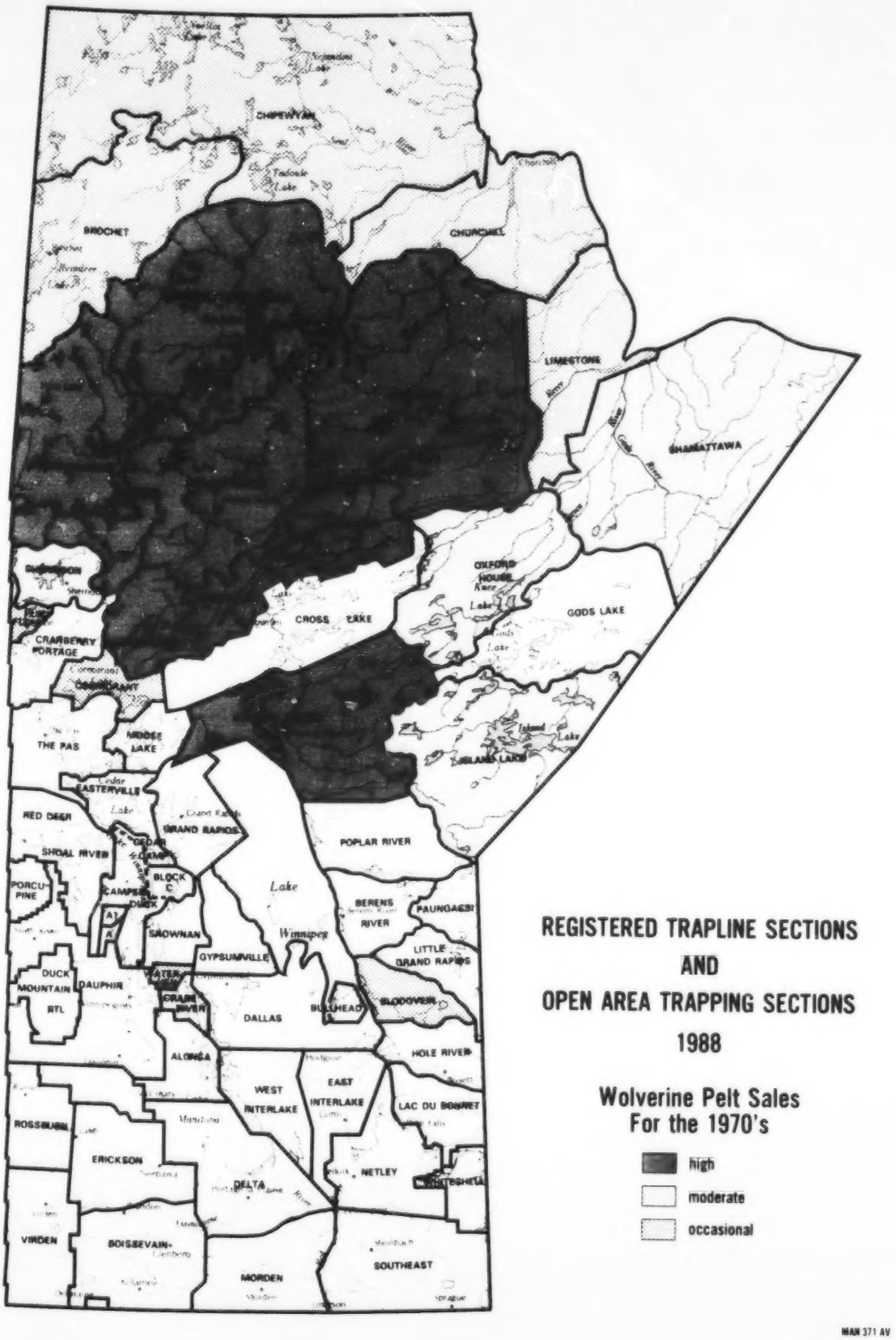

Figure 4: Wolverine pelt sales pattern in Manitoba for 1970s.

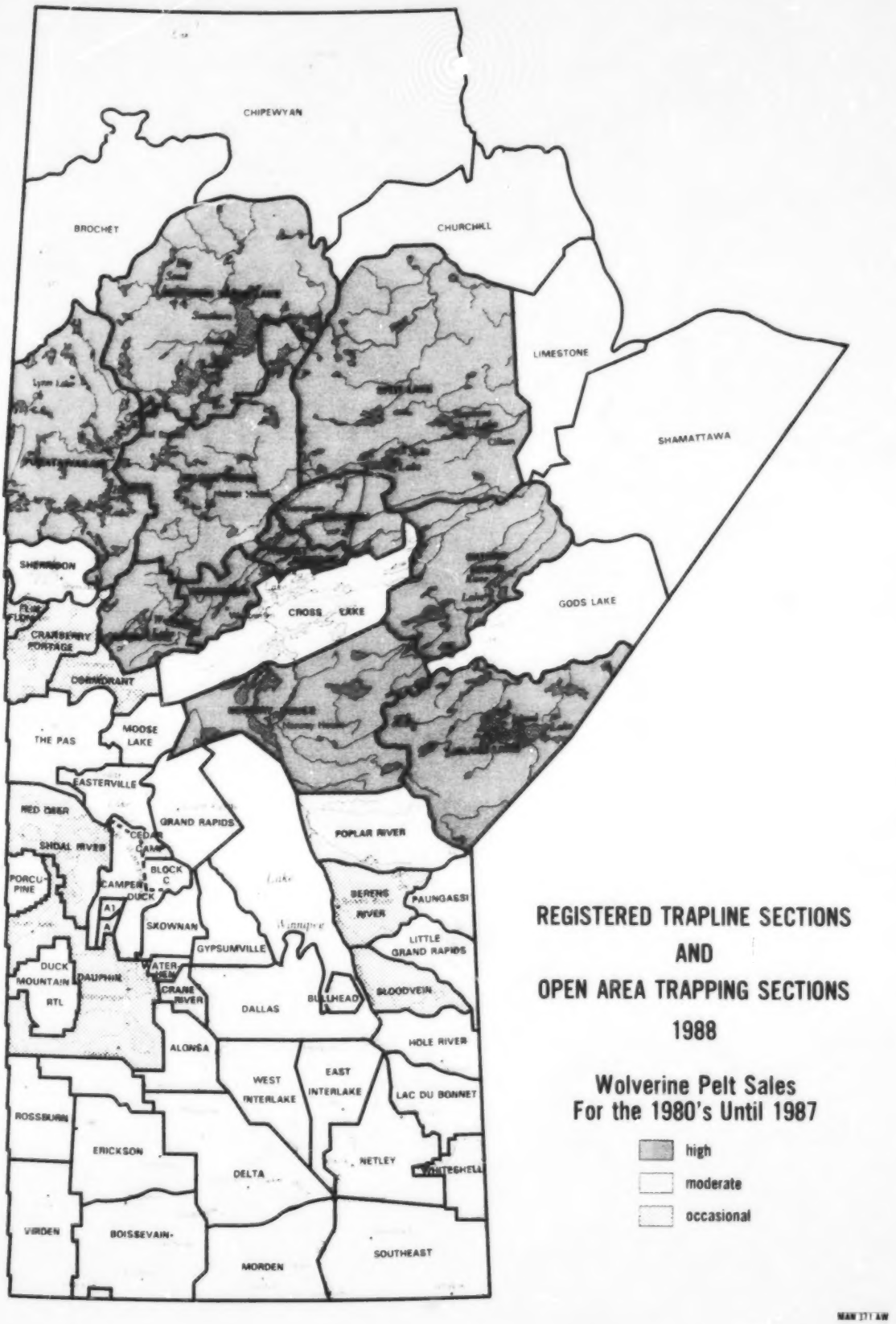

Figure 5: Wolverine pelt sales pattern in Manitoba for 1980s.

Table 1: Relative abundance and frequency of occurrence of wolverine in registered trapline sections from 1955/56 to 1988/89.

Section	1955/56-1970/71*				1971/72-1988/89			
	Total Number Wolverine Sold	Average Sales Per Year	Wolverine/ Yr./Trapper	No. Years Wolverine in Sales Record	Total Number Wolverine Sold	Average Sales Per Year	Wolverine/ Year/Trapper	No. Years Wolverine in Sales Record
Brochet	177	11.1	0.13	16 (100%)	3	0.2	<0.01	3 (18%)
Chipewyan	38	2.4	0.10	11 (69%)	5	0.3	<0.01	3 (18%)
Churchill	21	1.3	0.06	10 (62%)	5	0.3	0.01	4 (24%)
South Indian Lake	35	2.2	0.02	14 (88%)	73	4.3	0.05	15 (88%)
Nelson House	36	2.2	0.02	13 (81%)	38	2.2	0.02	6 (35%)
Pukatawagan	27	1.7	0.01	9 (56%)	98	5.8	0.05	17 (100%)
Split L/Limestone	12	0.8	0.01	10 (62%)	144	8.5	0.05	14 (82%)
Central District	15	0.9	0.01	8 (50%)	248	14.6	0.07	17 (100%)
Shamattawa	3	0.2	<0.01	3 (19%)	19	1.1	0.03	8 (47%)
Island Lake	2	0.1	<0.01	2 (12%)	46	2.7	0.01	12 (71%)
Oxford House	1	-	<0.01	1 (6%)	48	2.8	0.03	12 (71%)
E. Lake Winnipeg	1	-	<0.01	1 (6%)	4	0.2	<0.01	3 (18%)
Cross Lake					32	1.9	0.01	8 (47%)
God's Lake					19	1.1	0.02	4 (24%)
Norway House					66	3.9	0.03	17 (100%)

*from van Zyll de Jong (1972)

17 years 1971-1989 (Table 1). Sales were most frequently (>50%) reported from South Indian Lake, Split Lake, Pukatawagan and the Central District,(which included Snow Lake, Cormorant, Thicket Portage, Pikwitonei,Cranberry Portage, Sherridon and Wabowden), Island Lake, Oxford House and Norway House. Figure 4 is similar to the range indicated by van Zyll de Jong (1972) confirming the changed sales patterns.

The section with the highest yield (>.05 wolverine/year/active trapper) was the Central District which increased drastically in the past 17 years. It was a small area in comparison to more northerly sections and trappers may have made an extra effort to catch wolverine.

Although wolverine sales have not been recorded for Brochet for numerous years since 1971, questionnaire results (Johnson 1988, 1989) show there were wolverine still present in low numbers (7 in 1987-88 and 9 in 1988-89).

Van Zyll de Jong (1972) indicated there were few to no wolverine from Oxford House or God's Lake while for the past 17 years there have been an average of 2.82 sold/year and; from 1984-89 a total of 19 came from God's Lake section.

No record of a wolverine from Porcupine can be found in the existing files. Perhaps the pelt referred to by van Zyll de Jong (1972) may not have been harvested in the Porcupine section but was sold by a trapper from that section and over the years it may have been included in the proper section. Investigating recent sales records in areas of possible range extension revealed that these animals were actually caught elsewhere (out of province, within existing range) but were either sold or taken for

processing by the trapper in the given section.

The number of animals caught was dependent upon the number of active trappers, the effort expended to catch these animals, the total trapping area covered and the price of pelts (Kelsall 1981). The number of active trappers varied little from year to year. Price fluctuations were common and actual effort(# traps, # days) cannot be determined. The effect of price fluctuations has not been fully determined but Kelsall (1981) felt it may have an influence on the effort expended to catch wolverine. Our records show higher sales at times of higher prices (Appendix 1). This may be linked to the effort expended to catch other furbearers at times of high prices leading to the consequential captures of wolverine.

Presently the population number of wolverine in Manitoba can be estimated between 500 and 800 animals. These numbers were derived from questionnaire responses and using a home range of 700 km^2/animal within its given range. The range size was decided upon by using numbers from van Zyll de Jong (1972), Hornocker and Hash (1981), Banci (1987) and Dauphiné (1987). Food sources are not as diversified and plentiful as in the montane areas; therefore, the home ranges are probably larger. A large home range was used to err on the conservative side until more facts become available.

The growth rate of the population cannot be determined without an estimate of r (the intrinsic rate of increase) and an estimate of survivorship. To obtain these values an in-depth carcass analysis project and field studies are needed. The population appears to be stable in the short-term.

DISCUSSION

Van Zyll de Jong's (1972) estimate of 60 animals may or may not have been plausible at the time. He made his conclusions from sales records, these may or may not have been accurate. This number seems low considering the recovery this species has made in the 17 years since his study.

The large increase in the number sold in the late 70's and early 80's may be due to a number of reasons;

1) The cessation of an extensive wolf (*Canis lupus*) poisoning program, conducted from the late 50's until the mid 70's (pers. comm. D. Pastuck, Manitoba Natural Resources, Wolf Manager), allowed greater survival of wolverine. There have been no accurate records kept of the breadth of this program or the number of wolverine and other animals succumbing to the poison.

2) The cessation of wolf poisoning also allowed an increase in the population of this species. These primary predators provide a food source for the scavenging wolverine. The carrion left by wolf kills is an important component of its diet (van Zyll de Jong 1972, Hornocker and Hash 1981, Kelsall 1981).

3) In 1969-70 the trapping(harvest) season was restricted from a liberal, year-round open season to a 4-5 month season (Nov 1-Feb 28 or Mar 31) (Johnson 1989). This allowed the protection of females and their kits which are born in early February or March (Hash 1987). Many individuals considered wolverine as nuisance animals and would destroy them on sight while others only pursued them when they became destructive on the trapline. The shorter season would limit the general pursuit of the

wolverine and allow the females and young to survive. A female with young is likely to be more wary than usual and less likely to be caught accidentally. Natural mortality of wolverine is near zero and they have a limited homeostatic ability to compensate for losses. Human induced losses are additive (van Zyll de Jong 1972), and could have severely restricted the population for 40 years.

4) There was a general increase in fur prices for all species in the mid '70s through most of the '80s (Johnson 1989b) resultant in increased trapping activity. This may have partially accounted for the increase in the number of wolverine also caught, either by accident or by removal of nuisance animals on the trapline.

Early Brochet and Chipewyan harvests may have been mostly from migrating Northwest Territories animals which were not poisoned (van Zyll de Jong 1972).

The wolverine's survival is dependent upon a food source. The food source is largely in the form of carrion, especially in winter (van Zyll de Jong 1972, Hornocker and Hash 1981). Van Zyll de Jong's (1975) assessment of wolverine distribution and survival "implies a direct relationship between the biomass and turnover of large herbivore populations and the abundance and distribution of wolverines". As it is a scavenger it is highly susceptible to baits. The practice of poisoning predators on a widespread basis has been discontinued in the province and should never be re-instituted.

The wolverine is largely dependent upon big game as carrion be it death by intrinsic causes or from predation by other carnivores. Hornocker

and Hash (1981) found the greatest concentration of wolverine where there was a variety of large herbivores and a variety of other carnivores to provide carrion. In Manitoba the large herbivore populations are not greatly diversified but can be numerous at times. Care should be taken in big game management to not only consider human benefits but to consider carnivores/scavengers as dependent species. Big game should not be treated as a separate entity but part of the ecosystem. These species are the key to the survival of wolverine and other carnivores.

More study is needed to determine the dynamics of the wolverine population in Manitoba. To this end a tagging/carcass collection program be put in place to determine in a more exact manner the who, where, when, how and impact of wolverine harvest in Manitoba. As an extension of this a radiotelemetry home range study could be implemented if practical. All studies should be concomitant with big game monitoring as wolverine range size is dependent upon food availability (van Zyll de Jong 1972). The effect of increased forestry operations or other resource extraction or development should consider their impact primarily from a big game perspective and secondarily for carnivores (wolf, wolverine etc.)

The status of the wolverine in Manitoba at present appears to be good. It is low in number and widespread, which is the nature of the species. The wolverine has repopulated much of its former range in Manitoba and appears to be occupying almost all available area. The wolverine is not likely to expand its range much more in Manitoba as the remainder of it's former range has been settled and farmed. Food sources are not widely available there.

MANAGEMENT RECOMMENDATIONS

It is recommended that:

1) A pelt tagging/carcass collection program be implemented.

2) A home range/biological study be implemented if practical.

3) Widespread predator poisoning never be re-instituted in the province.

4) Big game management take into consideration the role of carnivores/scavengers in the ecosystem.

5) Forestry and other resource use or extraction activities take into consideration the impact of these activities primarily on big game and secondarily on the carnivores.

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APPENDIX I

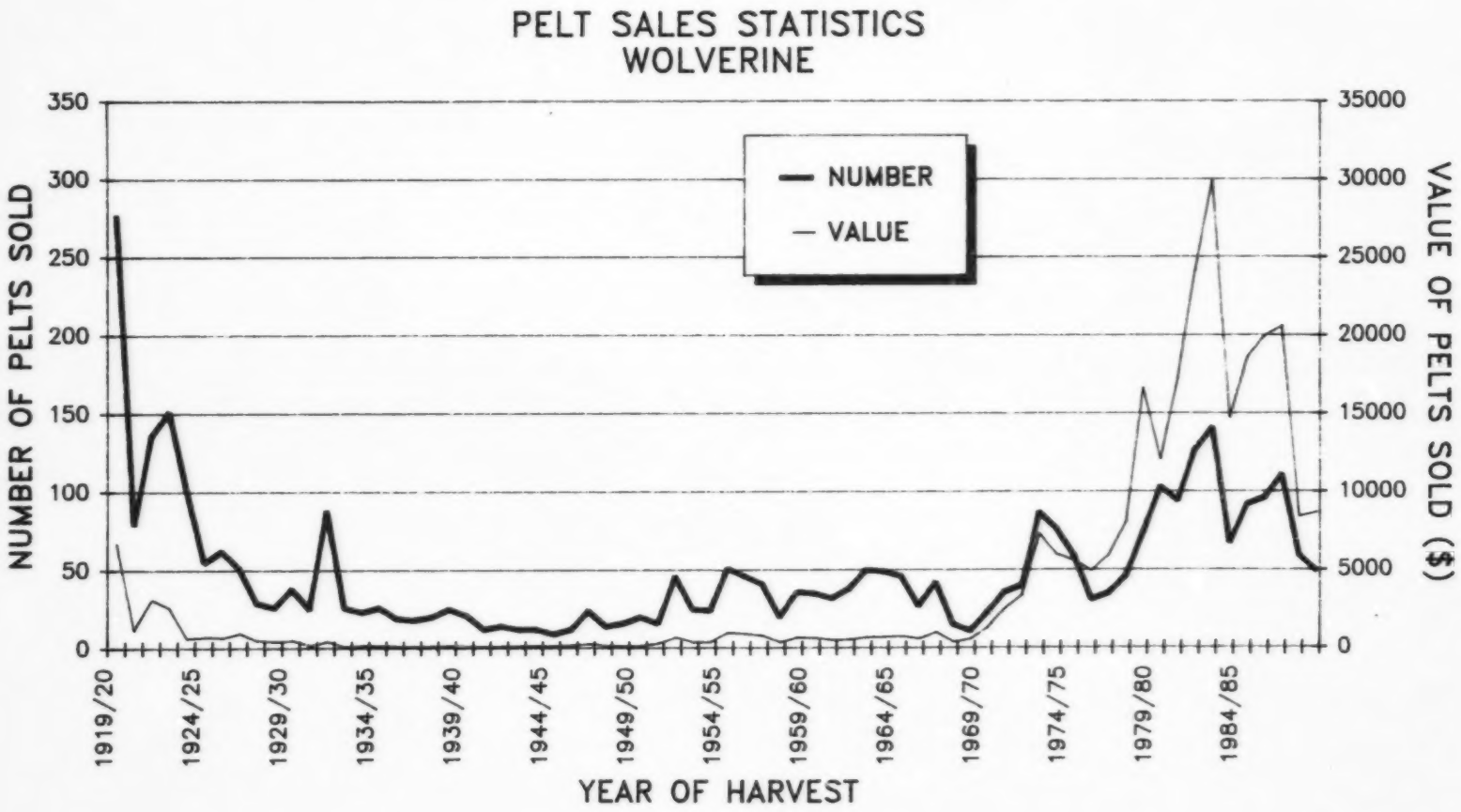
Wolverine pelt sales 1919-1989.

WOLVERINE

Fur Year	Pelts Reported Sold	Average Auction Value $	Value to Trapper $
1919/20	277	24.15	6689.55
1920/21	79	15.35	1212.65
1921/22	136	22.98	3125.28
1922/23	151	17.27	2607.77
1923/24	101	6.48	654.48
1924/25	55	13.28	730.40
1925/26	62	11.00	682.00
1926/27	51	19.00	969.00
1927/28	29	17.00	493.00
1928/29	26	16.75	435.50
1929/30	38	13.33	506.54
1930/31	25	7.50	187.50
1931/32	88	5.00	440.00
1932/33	26	3.80	98.80
1933/34	23	8.00	184.00
1934/35	26	6.00	156.00
1935/36	19	5.50	104.50
1936/37	18	5.89	106.02
1937/38	20	6.00	120.00
1938/39	25	5.87	146.75
1939/40	21	4.75	99.75
1940/41	12	7.70	92.40
1941/42	14	7.42	103.88
1942/43	12	10.00	120.00
1943/44	12	12.00	144.00
1944/45	9	16.00	144.00
1945/46	12	17.00	204.00
1946/47	24	11.60	278.40
1947/48	14	10.00	140.00
1948/49	16	8.00	128.00
1949/50	20	8.00	160.00
1950/51	16	20.00	320.00
1951/52	46	15.00	690.00
1952/53	25	15.33	383.25
1953/54	24	16.66	399.84
1954/55	51	19.33	985.83
1955/56	46	19.67	904.82
1956/57	41	19.33	792.53
1957/58	20	18.67	373.40
1958/59	36	18.66	671.76
1959/60	35	17.67	618.45
1960/61	32	15.67	501.44
1961/62	38	14.66	557.08
1962/63	50	14.00	700.00
1963/64	49	14.66	718.34
1964/65	46	16.34	751.64

WOLVERINE

Fur Year	Pelts Reported Sold	Average Auction Value $	Value to Trapper $
1965/66	27	22.00	594.00
1966/67	42	24.00	1008.00
1967/68	15	26.00	390.00
1968/69	11	52.50	577.50
1969/70	23	57.00	1311.00
1970/71	36	70.40	2534.40
1971/72	40	84.65	3386.00
1972/73	87	83.80	7290.60
1973/74	76	78.50	5966.00
1974/75	59	94.38	5568.42
1975/76	31	159.00	4929.00
1976/77	35	169.39	5928.65
1977/78	46	175.00	8050.00
1978/79	74	225.00	16650.00
1979/80	103	117.00	12051.00
1980/81	94	183.00	17202.00
1981/82	127	190.00	24130.00
1982/83	141	213.00	30033.00
1983/84	67	220.00	14740.00
1984/85	92	202.00	18584.00
1985/86	96	208.00	19968.00
1986/87	111	185.50	20590.50
1987/88	59	142.50	8407.50
1988/89	49	177.00	8673.00


PELT SALES STATISTICS
WOLVERINE
NUMBER
VALUE
NUMBER OF PELTS SOLD
VALUE OF PELTS SOLD ($)
YEAR OF HARVEST
0
50
100
150
200
250
300
350
5000
10000
15000
20000
25000
30000
35000
1919/20
1924/25
1929/30
1934/35
1939/40
1944/45
1949/50
1954/55
1959/60
1964/65
1969/70
1974/75
1979/80
1984/85

APPENDIX II

Wolverine pelt sales 1959 to 1989 listed by section.

WOLVERINE PELTS REPORTED SOLD, LISTED BY TRAPLINE SECTION FROM 1960-1987

FUR YEAR	BERENS R.	BLOODVEIN	BROCHET	CHURCHILL	CORMORANT	CRANBERRY PORTAGE	CROSS LAKE	FLIN FLON
1959/60			8					
1960/61			13					
1961/62			8					
1962/63			9					
1963/64			33	1				
1964/65			26			1		
1965/66			3	3				
1966/67			13	3				
1967/68			3					
1968/69				4				
1969/70		1	3	1				
1970/71			3	1				
1971/72				1				
1972/73				1				
1973/74					1			
1974/75						1		
1975/76								
1976/77								
1977/78								
1978/79			1					
1979/80						2	2	
1980/81						2		
1981/82			1	1			1	
1982/83				1		1	7	
1983/84					1			
1984/85	1					1	4	1
1985/86				2			2	
1986/87					1	1	8	
1987/88				1			7	
1988/89			1		2		3	1

WOLVERINE PELTS REPORTED SOLD, LISTED BY TRAPLINE SECTION FROM 1960-1987

FUR YEAR	GODS LAKE	GRAND RAPIDS	ISLAND LAKE	LIMESTONE	NELSON HOUSE	NORWAY HOUSE	OXFORD HOUSE
1959/60					4		
1960/61					1		
1961/62							
1962/63					5		
1963/64					1		
1964/65					2		
1965/66					3		
1966/67			1	1	2		
1967/68					1		
1968/69							
1969/70					2		1
1970/71					5	1	
1971/72				1	6		
1972/73					14	1	
1973/74					7	2	
1974/75					5		
1975/76			1				
1976/77			1		1		
1977/78						1	1
1978/79						2	1
1979/80			4	1		7	6
1980/81			1			7	2
1981/82			3	1		9	3
1982/83		3	2	2		2	9
1983/84			3	3		3	4
1984/85	1		5	3		8	4
1985/86	8		4			3	6
1986/87	7		12	1	6	2	5
1987/88	3		5	2	3	1	6
1988/89	3		5	1	3	1	1

WOLVERINE PELTS REPORTED SOLD, LISTED BY TRAPLINE SECTION FROM 1960-1987

FUR YEAR	PIKWITONEI	POPLAR RIVER	PUKATAWAGAN	SHOAL RIVER	SHAMATTAWA	SHERRIDON	SNOW LAKE
1959/60					1		
1960/61							
1961/62							
1962/63			2				
1963/64			2				
1964/65							
1965/66							
1966/67							
1967/68					1		
1968/69							
1969/70			3				
1970/71						1	
1971/72			9				
1972/73	4		11			1	8
1973/74	2		6		1		2
1974/75	1		11				3
1975/76			2				
1976/77	2		2				
1977/78	2		2				2
1978/79	2		7		2		8
1979/80	2		3		3		1
1980/81	11		6		4		9
1981/82	6		3				3
1982/83	6	2	7			1	6
1983/84	2	1	4				1
1984/85			10	4	1	2	7
1985/86	5		9			3	5
1986/87	3		8		3	3	6
1987/88	2		3		2	1	1
1988/89			4		3	1	1

WOLVERINE PELTS REPORTED SOLD, LISTED BY TRAPLINE SECTION FROM 1960-1987

FUR YEAR	SOUTHERN INDIAN LAKE	SPLIT LAKE	TADOULE LAKE	THICKET PORTAGE	WABOWDEN	WATERHEN	TOTAL
1959/60	6	1					20
1960/61		1	2				17
1961/62	1	2					11
1962/63	4	1	2	2			25
1963/64	5			1			43
1964/65	4	2	1				35
1965/66	2	1		3	1		16
1966/67		1	2				23
1967/68				1			6
1968/69	1						5
1969/70			1				12
1970/71	2	1					14
1971/72		2				1	20
1972/73	1	6		2	6		55
1973/74		4					24
1974/75	1			2	2		21
1975/76		3		1	1		13
1976/77	1			6	6		19
1977/78	1			2	2		13
1978/79	7	10	1	3			44
1979/80	7	7		3	3		51
1980/81	5	16		3	1		67
1981/82	2	10		5	9		57
1982/83	4	13	2	3	3		74
1983/84	6	8		1	6		43
1984/85	12	11		3	6		84
1985/86	12	5		3	3		71
1986/87	9	22		5	4		106
1987/88	1	4	1	4	6		53
1988/89	4	10		2	3		49